

they were taken appear very ancient ; soil has formed on them to the depth of three feet, and the largest trees grow on them and the connected embankments or levees. Another large collection, by Mr. F. W. Putnam, comes from fortifications, caves, and mounds in Indiana and Kentucky, and consist of implements, weapons, pottery, sandals, bark-cloth, crania, &c.

MR. F. CLOWES, B.Sc., has been appointed Natural Science Master in the recently-established Middle Class Public School at Newcastle-under-Lyne. Mr. Clowes is the author of a work on Practical Analysis, and is well known as a sound and accurate chemist.

PROF. C. F. HARTT, of Cornell, U.S., has been appointed, with Major Continho, a Brazilian, to take charge of the Geological Survey of Brazil.

IT is estimated that 10,000,000 acres of land in Algeria are covered with a spontaneous growth of the Alpha plant. The exportation of this fibre for paper-making has increased very rapidly during the past five or six years. In 1869 it amounted to 4,000 tons, in 1870 it rose to 32,000 tons, and in 1873 to 45,000 tons, while the past year's produce was expected to reach 60,000 tons. The average price at Oran is about 140 francs per ton.

A VERY fine specimen of the singular rubiaceous epiphyte *Hydnophyllum formicarium* has recently been received at the Kew Museum. This specimen measures some thirteen inches through, and was accompanied by some of the ants which make their nests in the fleshy tubers of the plant. These ants were very lively when received, and prove to be the *Camponotus irritans* of Smith.

PROF. BRADLEY, of Knoxville, Tennessee, has recently published the results of his geological labours among the Southern Appalachians, and they throw much light upon the probable age of the crystalline rocks of that region. It has long been the tendency of geologists to regard the metamorphic crystalline rocks of the Atlantic coast as certainly pre-Silurian. This has, however, been called in question by the observations of Prof. Dana, which go to prove that the limestones and accompanying schists and quartzites of Western New England are all Silurian, and not Huronian or Laurentian. Prof. Bradley now claims the same for the region he has investigated, that is, the western portion of North Carolina, the eastern part of Tennessee, and much of Georgia and Alabama. The evidence upon which the conclusion is based is stratigraphical, and must be studied in detail to be fully understood. The time at which the uplift and metamorphism of this region took place is considered by Prof. Bradley to have been post-carboniferous, and it is probably referable to the close of the palaeozoic.

A VERY interesting and important addition to the ethnological branch of the National Museum at Washington, U.S., has lately been made in the form of a large collection of objects of stone from Porto Rico. This was gathered from the ancient graves of the island during a period of many years by Mr. George Latimer, an American citizen residing in that place. The most noticeable features in the series consist of about fifty oval stone rings of much the size and shape of horse-collars, all variously carved and ornamented. There are also many statuettes, carved heads, triangular stones with faces of animals carved at either end, some pottery, and numerous axes and chisels—some of exquisite beauty, and polished to the highest degree. Many of them are of the green jade so much sought after by archaeologists.

MR. ELLIOT STOCK sends us an essay by Mr. T. K. Callard, F.G.S., on "The Geological Evidences of the Antiquity of Man reconsidered ;" being an attempt to show that man's antiquity is not so great as some eminent geologists make it to be,

and that "man's advent was accompanied by the introduction of a vast number of fresh forms both in the vegetable and animal life, and that this took place soon after a great devastation of the former flora and fauna, which devastation was accompanied by ice and water."

THE *Electric News and Telegraphic Reporter* is the title of a new journal, edited by Mr. W. Crookes, F.R.S., to be published every Thursday. We wish it success.

THE sturgeon fisheries of Schleswig Holstein yielded 1,917 fish during 1874, of which 1,355 were caught in the Elbe, and 562 in the Eider. In 1873 the total was 2,174.

M. A. LANCASTER, of the Brussels Observatory, sends us a paper, reprinted from the *Bulletin* of the Belgian Academy, on the remarkable dryness of the months of February, March, and April of this year.

MR. ELLERY'S "Monthly Record of Results of Observations in Meteorology, Terrestrial Magnetism," &c., at Melbourne Observatory, for September and October 1874, are to hand.

THE latest additions to the Manchester Aquarium include twelve Octopus (*Octopus vulgaris*) from the Channel Islands ; seven King, or Horse-Shoe Crabs (*Limulus polyphemus*) from North America ; twelve Large Spider Crabs (*Maia squinado*) from Devonshire ; two Lettered Terrapins (*Emys scripta*) from New Orleans ; two Salt-water Terrapins (*Malachlemys concentrica*) from Mexico ; one Horned Toad or Crowned Tapaxaxin (*Phrynosoma cornutum*) from Mexico ; one Alligator (*Alligator mississippiensis*) three feet long.

THE additions to the Zoological Society's Gardens during the past week include two Macaque Monkeys (*Macacus cynomolgus*) from India, presented by Lord Lindsay ; a Sloth Bear (*Melursus labiatus*) from India, presented by Mr. Richard A. Roberts ; three American Red Foxes (*Canis fulvus*) from N. America, presented by Mr. Edward Darke ; a Peregrine Falcon (*Falco peregrinus*), European, presented by Mr. H. J. Watson ; a Water Viper (*Cenchris piscivorus*) from N. America, presented by Mr. J. F. Painter ; a Gambian Goshawk (*Astur tibialis*) from W. Africa, purchased ; three Indian Adjutants (*Leptoptilus argala*), two Pondicherry Vultures (*Vultur calvus*), seven Indian Cobras (*Naia tripudians*) from India, deposited ; six Trumpeter Swans (*Cygnus buccinator*), a Common Fallow Deer (*Dama vulgaris*) born in the Gardens.

#### OUR BOTANICAL COLUMN

THE POTATO DISEASE.—It will be remembered by those of our readers interested in the potato disease, that Lord Cathcart offered a prize in 1873 for the best essay on the "Potato Disease and its Prevention ;" and it will also be fresh in their memories that of the ninety-four essays sent in, not one was considered by the judges to deserve the prize. This circumstance, and Prof. Dyer's summary of the history of what was known of the disease, delivered before the Horticultural Society last year, gave rise to some correspondence in this and other journals. Few subjects, probably, have been so fertile a source of wild theories and speculations. Mr. Eccles Haigh, one of the competitors for Lord Cathcart's prize, now comes before the public on his own responsibility, with a theory which at least has the merit of ingenuity, and is based upon a cleverly worked out idea. But it seems to us that the writer has taken up a wholly untenable position. In a pamphlet of forty-four pages, small octavo, the writer traces the causes not only of the murrain, in which *Peronospora infestans* is so destructive, but also of the "curl," a disease very prevalent just before the appearance of the present scourge ; and, to his own satisfaction, explains how these diseases are to be prevented. To be brief, gardeners are credited with having induced by their mode of cultivation the "curl," and afterwards, in getting rid of that, brought on the present far more formidable scourge. Mr. Haigh endeavours to show that during the "curl"

period the potato bore enormous crops of berries, whilst since the prevalence of the murrain it has almost ceased flowering and fruiting; and in these facts (?) lies the whole gist of the matter. The production of fruit in profusion is regarded as an exhausting process so far as the tubers are concerned, and this is so far a very philosophic assumption, inasmuch as fruit-bearing is one of two ways to ensure the propagation of the plant. But here it becomes necessary to give the author's view respecting the "Functions of Nitrogenous Matter." It is in substance that the formation of fruit draws the nitrogenous matter from the plant and tubers, and when excessive crops of fruit are borne, the tubers are left without sufficient of this vital principle to continue the existence of the plant. On the other hand, when little or no fruit is produced, the tubers are left overcharged with this nitrogenous matter, which here becomes a source of decomposition, in proof whereof we are gravely told that the decay of manure is due to the presence of nitrogenous matter. It has long been admitted that excessive luxuriance predisposes in favour of disease; but this assumed presence of nitrogenous matter in the wrong place will hardly be accepted as an adequate explanation of the phenomena presented by the curl and the murrain. It is assumed that the potato left off bearing berries just about the time of the appearance of the murrain, and this we are told was brought about by the use of artificial manures containing a large percentage of nitrogenous matter. The "curl" was cured or rather prevented by using sets (tubers) from plants which had not been allowed to ripen seed. We have not space to examine the writer's arguments in support of this theory, but we may give his remedy.

"Having so fully set forth the natural habit of the plant, and so copiously elucidated the principles on which my theory of the disease is founded, the means of its prevention all but suggest themselves. They require compliance with but two simple forms: regenerate through the seed two or three times, and abstain as nearly as practicable, not only from nitrogenous artificial manures, such as guano, sulphate of ammonia, rape-cake, nitrate of soda, but also from strong farmyard manure."

We do not intend to attempt to refute the author in detail here, as it would occupy too much space; but we may observe that the condition of practical experience imposed upon the competitors for the Cathcart prize, of which our author complains because it disqualifies him, was the wisest provision in the whole business. It is just this want of practical experience and personal knowledge that has led him astray in regard to the berry-producing power of varieties now cultivated, of the description of manure usually employed, &c. Why all varieties of the potato in all parts of the kingdom should have become just so much overcharged with nitrogenous matter at exactly the same time as to take the disease is rather puzzling. Does the writer not know that the Vine Mildew, *Oidium Tuckeri*, has been successfully combated?

Since the preceding lines were written, the report of a new (?) disease having attacked the potato-crop has caused some consternation and alarm. First we hear that it has destroyed the entire crop of American varieties in the trial gardens of the Horticultural Society at Chiswick; then the appearance of the same disease is observed in Northumberland, but here again only American varieties are affected, and a vain hope is indulged in that it may soon be stamped out. The following week, however, the horticultural journals begin to team with letters from the most distant parts, and the unwelcome truth that all varieties are alike attacked, or liable to be attacked, is forced upon us. True, we read of certain varieties being diseased, whilst others remain healthy in the same garden, but we fear there is no ground for believing that it is restricted to any particular varieties, whether of English or American origin. The Rev. M. J. Berkeley is investigating the nature of the disease, which he regards with considerable anxiety. It appears to be caused by, or perhaps succeeded by, a fungus growth. At all events a fungus is present; but we must await a thorough microscopical examination for more precise information. Mr. Shirley Hibberd, in a letter to the editor of the *Times*, takes a more hopeful view of the matter than we can; and his description of the nature and spread of the disease is not borne out by the reports from other quarters. His statement that the new disease begins in the "set" and progresses upwards, is in direct contradiction to the experience of others. In the *Gardener's Chronicle* it is affirmed that the sets of affected plants were cut in two, and in no case was there the slightest evidence of disease in the tuber causing immaturity and diseased haulm. Possibly, however, it may manifest itself in different forms.

### SCIENTIFIC SERIALS

THE *Journal of the Chemical Society*, April and May.—The April number contains the following papers:—Researches on the paraffins existing in Pennsylvanian petroleum, by Thos. M. Morgan. This paper is followed by some remarks on the same subject by Prof. C. Schorlemmer.—On Groves' method of preparing chlorides, by the same.—A note on aricine, by David Howard.—On the precipitation of metals by zinc, by J. L. Davies. The author failed to precipitate to any large extent many of the metals which, according to some metallurgical books, are precipitated by zinc from acid solutions. Copper and the other well-known metals reduced by zinc precipitate well enough, but nickel, cobalt, iron, &c., do not. If, however, ammonia was added to their solutions the precipitating power of the zinc was rendered as efficient as under ordinary circumstances it is with copper, &c. The zinc was used in the shape of filings, and the author remarks that the metals precipitated by it under the above circumstances present a beautiful metallic appearance, and are in a weighable form.—On the action of the organic acids and their anhydrides on the natural alkaloids (Part III.), by G. H. Beckett and C. R. Alder Wright. The authors in this paper treat first of the action of acetic anhydride on the polymerides of codeine and morphine (dicodeine, tetracodeine, and tetramorphine being considered, further also the action of ethyl iodide on tetracodeine and octacetyl-tetracodeine); they then speak of isomeric diacetyl morphines, and of the action of ethyl iodide on acetylated morphine, codeine derivatives, and analogous products. The compounds treated of in the latter division are diacetyl-codeine ethiodide, tetracetyl-morphine ethiodide,  $\alpha$ -,  $\beta$ -, and  $\gamma$ -diacetyl-morphine ethiodide, dibutyryl-codeine ethiodide, tetrabutyryl-morphine ethiodide, dibutyryl-morphine ethiodide, dibenzoyl-codeine ethiodide, tetrabenzoyl-morphine ethiodide, and  $\alpha$  diacetyl-dibenzoyl-morphine ethiodide. Finally, there is an account of the action of ethylate of sodium on acetylated codeine and morphine.—The *Journal*, as usual, contains numerous abstracts from other serials.—The May number contains the following papers:—Further researches on bilirubin and its compounds, by Dr. J. L. W. Thudichum. This is a most elaborate paper, and we must refrain from entering on its details, confining ourselves to a mere outline of its contents. First, the author gives an account of the behaviour of bilirubin with the halogens, and in turn speaks of mono- and dibromo-bilirubin, the tri- and tetrachloro-bilirubin (with iodine there is no reaction at 80° to 100°). Then Dr. Thudichum proceeds to consider the operations made by chemists on bilirubin, prior to his own. He then describes some experiments bearing upon the alleged transformation of bilirubin into the colouring matter of urine, and treats of Mal's hydrobilirubin, urochrome spectra, and the spectra of the chemolytic products of bilirubin. We then have an account of experiments made with Jaffé's product, with which Mal compared his biliary product more particularly. Jaffé's product was obtained from febrile persons, and Dr. Thudichum points out that a source of error must here be eliminated, namely, the abnormal product erythrin. He gives the spectrum and a new reaction of this compound; finally, there is a note on Jaffé's urobilin. The paper ends with a summary of conclusions against the alleged metamorphosis, and with some remarks on the author's theory of bilirubin and bilirubates, and on Städeler's hypothesis regarding the same.—On calcic hypochlorite from bleaching powder, by Charles T. Kingzett. This treatise turns on the chemical constitution of bleaching powder, on which subject the opinions of eminent chemists are at variance. The author describes four experiments which he made with a view to bring light into the matter, but he was not completely successful. Although his experiments may be regarded as a perfect proof of the body being in mass hypochlorite of calcium, yet he is nevertheless reluctant in being too positive on the subject, and recommends further investigation.—On a simple method of assaying iron, by Walter Noel Hartley. The principles on which this method depends are (1) The abolition of weights by exactly balancing a quantity of the ore to be examined against pure iron wire. (2) The reduction of inaccuracies in weighing by making the solutions of the iron and the ore up to the same volume, and taking a fraction (about  $\frac{1}{10}$ ) of the liquid for experiment, whereby the error of the balance is diminished  $\frac{1}{10}$ . (3) The reduction of all other experimental errors to a minimum by putting comparable quantities of both ore and pure iron under precisely the same conditions. There is the usual number of abstracts in this part.